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ON THE HABITS AND MIGRATION OF THE SNOW BUNTING.

BY JOHN CORDEAUX.

THE plate which illustrates this paper, drawn and kindly contributed by Mr. Charles Whymper, represents the nest and eggs of the Snow Bunting, and is a relic of the adventurous journey undertaken by his brother, Mr. Edward Whymper, who in the spring and summer of 1874 endeavoured to explore some portion of Greenland, with the hope of determining the character of the interior of that ice-burdened land.

Professor Newton, in his admirable and concise notice of this species (Yarrell's 'British Birds,' 4th edition, vol. ii., pp. 1—14), thus describes the nest:—"A rude collection of dry grass, moss or any other plants that may be growing near, forms the foundation and outworks of the nest. This is hollowed out to receive a quantity of finer grass and roots substantially woven into a bowl, which will occasionally bear removal from the outer mass without losing its shape, and is lined with hair or soft feathers—especially those of the Ptarmigan of the country. Herein are laid the eggs, from four to six or even eight in number, measuring from ·91 to ·82 by from ·65 to ·57 in. They are white, more or less tinged with pale greenish blue, on which are patches of lilac, sometimes very bright, but generally dull, the whole closely or sparingly spotted, streaked and splashed with deep brownish red, upon which again are frequently a few apparently black spots and irregular lines. Some eggs when fresh are of exceeding and almost indescribable beauty."

Dr. Elliott Coues, in his report on the Ornithology of the Prybilov,* near the middle of Behring's Sea, and off the coast of Alaska, says that the Snow Bunting, or Snow-bird, is a permanent resident on the islands, nesting high on the rocky broken uplands, and only entering the villages during unusually severe or protracted cold weather. "It builds an elegant nest of soft dry grass, and lines it warmly with a thick bed of feathers, placing it on the ground generally beneath some lava-slate, or at the foot of a boulder." The eggs he describes as usually five in number.

Professor Newton, in the article above quoted, has collected a great mass of evidence proving undoubtedly that the southern breeding range of the Snow Bunting extends as far south as the Grampians, old birds in summer, and the young in the autumn, having frequently been observed on some of the highest Ptarmigan hills in Scotland, and it is rather surprising that on the mainland the nest should have hitherto escaped detection.

There is no doubt that a few pairs breed regularly in Shetland, and the late lamented Dr. Saxby, whose early death every reader of this journal must regret, states ('Birds of Shetland,' p. 94) that twice he had the nest and eggs brought to him; once in July, 1861, found in a crevice of the rock near the top of one of the high sea-cliffs at Burrafirth, below the hill of Saxaford; and again, in 1871, a man who used to collect for him brought, as a present, a Snow Bunting's nest and four eggs, found amongst the stones of the demolished cairn at Saxaford the summer before. These two, so far as I am aware, are the only instances of the Snow Bunting's nest being found in the British Isles.

Northward of Great Britain it nests regularly in the Færoes, in Norway, on the northern islands of the coast, as well as on the high fells of the interior. In Iceland it is the commonest of the smaller birds, and in Spitsbergen, as Prof. Newton says, is the only Passerine bird which is ordinarily met with. Northward still it finds a congenial home on Kaiser Franz Joseph Land and on many a barren island in the ice-encumbered northern seas, and doubtless also on undiscovered lands nearer to the Pole, as yet untrodden by human footsteps.

Considering the position in which the nest is placed, under some boulder or ledge of rock, it is not surprising that it should

* 'The Fauna of the Prybilov Islands,' by Dr. Elliott Coues, ed. J. E. Harting, p. 17 (1875).

so rarely be discovered. Mr. Wheelwright ('A Spring and Summer in Lapland),' says he always found it higher up the fells than the Shore Lark, but never succeeded in discovering the nest. The wildest and most desolate spots on these Arctic fells were the haunt of the little Snow-flake; miles of broken ground, covered with nothing but loose shingly slate and ironstone, and scattered boulders of erratic rock. No wonder, then, that the nest is so difficult to discover.

The nest has also occasionally been found amidst the great masses of drift-wood, river-borne, cast by currents on the Polar shores, containing perchance relics of stout-ribbed ships lost in the whale fishery, or of such as have failed, striving nobly to the end, to find the great white gate leading to the Pole. Strangest of all places for nesting, Captain Lyons relates how, on the barren coast of an Arctic island, he found the nest of a Snow Bunting in a shallow grave within the bleached skeleton of an Eskimo child.

It appears that the breeding quarters of this species extend from near the Pole as far south as latitude 56° 40′ North in the British Isles, and are restricted less by the latitude than elevation above sea-level. Like the Ptarmigan, the feathers of which are so frequently found in its nest, it lingers still on the summits of the highest mountains in North Britain, amongst the dwarf-willow and snow-saxifrage, and many a bonny Arctic plant, last relics of that old fauna and flora which in the glacial period extended, with the Lapp, Reindeer, and Snowy Owl, even to the blue waters of the Mediterranean.

Notwithstanding the high latitudes in which the Snow Bunting nests, it is by no means a late breeder. Capt. Feilden found it nesting plentifully in the neighbourhood of Godhavn in the second week in July, in one case with the young nearly ready to fly. In Novaja Zemlia, Th. Von Heuglin states ('Ibis,' 1872, p. 61), it is everywhere abundant; he found newly-fledged young at the beginning of August, at which time there were still birds unable to fly; he says that the autumnal moult of the old ones occurs at the end of August, and the southern migration commences about the middle of September. Capt. Feilden remarks that, on the return of the last Polar Expedition under Capt. Nares, when near lat. 73° 40′ N., on September 18th, flocks of Snow Buntings were seen migrating to the south. In 1874 Mr. Seebohm found them breeding on the island of Vadso in the Varanger Fjord, but was

too late for the eggs; the young were already in the nest by the middle of June.

The migratory flocks do not, as a rule, arrive on our English coast before the end of October or early in November. Their abundance or otherwise seems partly regulated by the character of the season. In mild winters we have few, but in severe winters they are often very abundant, single flocks alone containing many thousands. By the middle of October I have generally found a few beautiful old males* on the Holderness coast. The high cliffs north of Easington, as well as those lower ones near Kilnsea, and Spurn Point itself, are very favourite haunts of the Snow Bunting on its first coming.†

Dimlington "highland," some miles north of Spurn, at its greatest height is 146 feet.‡ The perishable nature of these cliffs, as well as the rapid and increasing encroachments of the North Sea, are here clearly demonstrated. From a few feet below the summit the cliff slopes away in an enormous talus—a mass of piled-up ruin, cast down under the combined influences of frost and rain. Great masses from the top, many yards in width, are constantly slipping seawards and adding to the ruin. Here in October I have sometimes seen a solitary Snow Bunting which has come in long before his fellows, flitting from one point to another of the broken cliff—beautiful old birds, in that lovely transitional

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* These solitary birds arriving before the regular migration are invariably old males, and any early-killed Snow Bunting recorded may, without doubt, be put down as an old male. In Heligoland Mr. Gätke remarks, "Snow Buntings turn up here occasionally as early as the latter half of August, but these are invariably young."

† If the number of Snow Buntings appearing on our east coast is to be taken as an indication of a severe winter, this of 1880-81 should be a severe one. To-day (November 24th) I have seen an immense number, thousands and thousands, on stubble and grass alike; all appear to be young birds of the year and females, not half-a-dozen old males.

‡ Dimlington heights are the most prominent land on approaching the otherwise flat shores of the Humber, and naturally attract migrants on their first arrival. They are a favourite resting-place of the Rough-legged Buzzard and other large Raptores in their wanderings. Prof. Phillips ('Rivers, Mountains, and Sea-coast of Yorkshire') calculates the annual waste of the Holderness coast from Spurn to Flamborough as equal to 2¼ yards per year along its entire length, so that one mile in breadth has been lost since the Norman Conquest, two miles since the Roman Invasion. My own experience would now put the annual waste at much more than this, especially for some miles north of Spurn.

dress from summer to winter, the head washed with fawn-colour, and each black feather on the back, between the scapulars, edged with a fringe of brownish white. Often, too, may be seen an old bird or two on the beach at Spurn Point, searching the tide-wrack for insects, their presence only made apparent by the white flicker of wings as they shift their ground.

The first flocks, when they arrive early in November, consist mainly of the young of the year and a few females, rarely any old males. No two birds are exactly alike; and, when observed with a good glass at close range, each individual has a very curious appearance, as if the colours are laid on in stripes from the head to the tail, like the painted birds in a "Noah's Ark." Sometimes, with an increase or sudden outburst of very severe weather in Northern Europe later in the winter, a second migration of Snow Buntings is not infrequent; these are mainly old birds, or contain a much larger proportion of old birds than are seen in the earlier immigrations, and doubtless are Snow Buntings which would never have come to us were it not for some strong impelling cause, as an advent of intensely severe weather on the Continent, exactly as such weather early in the year will cause a sudden influx of old Fieldfares and Blackbirds with yellow bills.

On their first arrival Snow Buntings feed mainly on the seeds of such salt-loving plants as *Schoberia maritima* and *Glaux maritima*, and others; later, when dispersed over the marshes, they feed on the seeds of various field weeds and grasses. No small bird which frequents our bleak and inhospitable marshes is capable of withstanding such severe cold; for long after all other birds have been driven into the stack-yards, we hear their cheerful chirrup, and can watch them coursing over the hard frozen snow and picking the seeds from the withered bents which rise above the otherwise universal white. As a rule, they prefer the neighbourhood of the coast, but I have occasionally seen flocks on the "wolds" some distance inland; and Mr. William Eagle Clarke informs me that in the severe winter of 1878-79 a large flock came quite into the borough of Leeds, frequenting some rough ground adjoining one of the busiest manufacturing portions of the town.

Examine them when we will, we rarely find a Snow Bunting anything but plump and fat, and under certain emergencies they are not to be despised on the table. Dr. Saxby narrates (Zool. 1871, p. 2535) that when, from the non-arrival of the

ships, provisions were scarce, a dish of fat Snow Buntings became not only an agreeable change, but an actual necessity. Messrs. Seebohm and J. A. Harvie-Brown ('Ibis,' 1876, p. 118) state that in the neighbourhood of Ust-Zylma, on the Petchora river, in spring, great numbers are taken by the boys in horse-hair nooses, and are sold 100 for half a rouble, and very good eating they are. Towards the beginning of April they saw large flocks feeding on the great manure heaps by the side of the river Mezen, close to the town of that name.

In its summer haunts the Snow Bunting feeds much on the buds of *Saxifraga oppositifolia*, and the larvæ of midges and mosquitoes, collected from the many little shallow pools where they undergo their metamorphoses, as those who have spent June and July in high latitudes have discovered to their cost. It is said that Snow Buntings do not perch on trees or bushes; they commonly do this both in North America in the winter and in Northern Europe during the summer.* Of late years I have seen small flocks fly from the "fitties" on the Lincolnshire coast, and crossing the embankment alight on the top of one of those tall shelter-hedges so frequent in the marshes. They are also very fond of perching on any slight eminence, such as a stone or sod, and it is not uncommon to see a newly-sown field of corn with a bird perched on each prominent clod.

Snow Buntings leave us late in February or early in March, and in North-East Lincolnshire I have not seen them later than the 21st of this month,† at which time the old males had the dark feathers on the back, but edged with brownish grey. The local name of this species on the east coast is "Norway Sparrow," also "Snow-bird" and "Snowflake." The Danish name is "Snefugle," and by the Eskimo it is called "Trapaluarsak."

There appear to be two, if not three, races or varieties of this species, the American and Greenland bird, not specifically distinct from the European, but differing in being larger and more stoutly built. It is quite possible that examples of this larger race may occur occasionally in Europe. Somewhere, we know, in regions near the Pole, the summer homes of the two races must

* See 'Siberia in Europe,' by H. Seebohm, 1880, p, 37.

† Mr. St. John ('Nat. Hist. & Sport in Moray,' p. 281) says, "They leave us late, some remaining to the first week in May." These, however, may be birds which nest in Scotland, retiring in May from the coast to the interior.

meet, if they do not overlap, and it is reasonable to suppose that flocks of either may travel southward in the autumn migration into either continent. Our common European bird appears to be intermediate in size between this and a smaller race, which in Heligoland, as Mr. Gätke has informed me, arrives later than the other; he has only once obtained a fine and perfect adult specimen. These are not only smaller, but lighter in colour; the rusty edges of the upper parts are not so brown as with the bigger ones, which holds good throughout all ages. Mr. Gätke further remarks, "Snow Buntings have of late years decreased here very markedly, and really old birds with white wings, except the black feathers of the thumb, are very rare, perhaps one in a hundred; so are the small race." Mr. Gätke's examples of these two races, which I have seen in his Heligoland collection, certainly exhibit a very marked difference in size.

The little "Snow-flake" has the pre-eminence of having been seen nearer the Pole than any other species. Capt. Markham relates how, on the return journey of the sledge party despatched in the spring of 1876, in the direction of the North Pole, at a time of great suffering, when the exhausted men were in the grasp of their deadly foe, the scurvy, a Snow Bunting one day appeared on a neighbouring hummock on that vast and dreary Palæocrystic sea, and encouraged them to fresh exertions by its cheerful chirrup.

To the lover of birds dwelling on the east coast there is no greater favourite than our "Snowflake," for it comes when summer birds are gone, in the darkness of the declining year, enlivening the bleak coast or marsh with its cheerful call, and making beautiful the dreary landscape by the flicker of hundreds of white-patched wings; so that, seen against the dark background of a lowering sky—which in itself causes the dark portions of the plumage to become invisible—it has exactly the appearance of those large feather-like and slowly-drifting flakes which herald the approaching storm. How much more a favourite should it be to those who have watched it in its summer haunts, in the sheltered quiet of some Greenland valley, strewed with the yellow flowers of the little Arctic poppy, or crimson with blossoms of *Silene acaulis*, that most lovely of northern plants, and there listened to the sweet song of the male, trilled out under the midnight sun, as, perched on some lichen-spotted boulder or sprig of Arctic willow, he serenades in her dark cell his brooding mate.

THE PAST AND PRESENT DISTRIBUTION OF SOME OF THE RARER ANIMALS OF SCOTLAND.

By J. A. Harvie-Brown, F.Z.S.

I. The Wild Cat.

It has been truly remarked that "the exterminating process is generally one that excites little or no attention until the doom of the victim is sealed."* Thus we find that, although much has been done in collecting and publishing records connected with our now extinct species, such as, for example, the Great Auk† and the Wolf, not to speak of the more remote Beaver, Boar, Bear, and many others,‡ comparatively little attention has been paid to the animals which, though not extinct, yet in this country are on the fair way of becoming so.

For some time past I have accumulated statistics concerning the occurrence of several of our rarer indigenous Scottish mammals and birds, many of which, though formerly abundant and widely dispersed, have, in comparatively recent times, disappeared from certain districts and localities, retreating to the wilder and less accessible portions of the country, before the adverse circumstances which have been gradually surrounding them. Confining my investigations to Scotland, for the most part, I have taken up this subject in the hope of saving from oblivion such anecdotes and statistics as I have been able to collect, independently of already published records in easily available works of reference.

One thing should be borne in mind in such enquiries as the present, *viz.*, if ordinary care be taken to collect statistics from as many neighbouring districts as possible, a fairly accurate idea must be obtained of the latest occurrences of our rarer *Carnivoræ*. Great as distances are in the Highlands, the proverbial "bittock" lengthening out to miles, news travels fleetly, and especially any

* A. Newton, "The Gare-fowl and its Historians," Nat. Hist. Review, 1865, p. 467.

† For the history of this extinct species in Scotland see the above-cited article, and, besides other minor papers, those by Mr. Robert Gray, 'Birds of the West of Scotland,' and Dr. J. A. Smith, 'Remains of the Great Auk, *Alca impennis*, in Caithness' (Proc. Royal Antiquarian Soc. Edinb., vol. xiii., New Series, I., 1878-9), where most of the information regarding it will be found.

‡ See J. E. Harting, 'Extinct British Animals.' Trübner & Co. 1880.

news connected with the chase, or with Foxes, Cats, or other vermin.* I have taken considerable care to include as many available districts as possible, and have been most careful and minute in my inquiries in these parts where the animals have become extinct, because I have deemed it desirable to record such minutiæ so long as they are available; but where there is no immediate prospect of the different species becoming extinct I have thought it better to withhold my information for the present lest, by publishing it, the extinction which we deplore may be hastened.

Generally throughout my work I have been greatly assisted by many kind friends and correspondents in all parts of the country, who have always cheerfully replied to my enquiries, and it has been a pleasure to me to observe that an increasing interest is being taken in the natural history of our indigenous animals. I cannot now express more fully my sense of indebtedness to them, but may entertain the hope that they will continue to favour me with their communications.

In my treatment of the subject I have been obliged to condense the material I received as much as possible, and have therefore seldom given my direct authorities for the statements in the text; but when I say that every item of information, with exact, or approximate, dates, is carefully preserved *in extenso* in my note-books, and that each party who has supplied information will, upon reading this paper, be able to identify those items which he has himself supplied, I think enough is said as regards the authenticity of the statistics. At the same time I have in many cases taken pains to verify the accounts which have reached me, and I have included none which I have had good reason to doubt, or which appeared to me to be incomplete.

The Wild Cat, *Felis catus*, has never been a native of the Islands of Scotland, if we may judge from its entire absence from them at the present time, as well as that of certain other mammals, the early arrival of which, along with the present species, appears to have taken place at a comparatively recent date, namely, since

* Thus a single individual—we will say a forester on a great deer forest, such as Athole or Breadalbane—in most cases is able to tell exactly or approximately the date of the last one killed, not only on his own beat, but perhaps on the beats of all his brother foresters and keepers for miles around.

the separation of the Orkney Islands from the mainland;* but its distribution over the mainland of Scotland at a time not very remote, must have been general, as we find records of it from the Border counties northward to Cape Wrath and Caithness. Pennant was probably in error when he assigned it a place amongst the mammals of Arran. From all the evidence at command it appears to have retreated northward from the southern counties, and to the wilder and more mountainous portions of the Highlands from the lower lying and more cultivated districts, finally finding refuge only in the deer-forests and larger extents of moorland where it has been least subjected to persecution.

Mr. Alston, in his latest remarks (*op. cit.*), says, "I believe that none now exist south of the northern districts of Argyll and Perthshire;" and from localities south of the limit indicated, I certainly find most difficulty in collecting any data, except such as has already been recorded by other writers.

Beginning in the south of the country and proceeding northwards, I propose first to treat of the localities or districts in which it has become extinct, recording, as far as materials permit, the approximate dates and circumstances of the last specimens killed, and any traditions connected with its former abundance, avoiding, however, as far as possible, tedious repetition of already existing records, except in so far as is necessary for the continuity of this paper. As I reach farther northward, to the districts where it is still far from approaching actual extinction, I will select from my notes and correspondence such particulars of its distribution, incidents of captures, &c., as may prove most interesting to the general reader, but will avoid going into details, which, however important and interesting after a species becomes extinct, it is

* See Alston, 'Fauna of Scotland' (Mammalia), in the series published by the Natural History Society of Glasgow, 1880. I have statements from correspondents of the occurrence of the Wild Cat in the Isle of Skye, but the evidence is too conflicting to justify any faith whatever in the presence of the true Wild Cat there. It has, I believe, never been known there, and large specimens of the tabby run wild have been recorded as true Wild Cats. One weighing between thirty and forty pounds, according to a correspondent, for a long period adorned the hall of Kirkibost House, but is not now forthcoming. The "small species of Wild Cat" of the 'Old Statistical Account' (1793, vol. viii. p. 51), inhabiting the islands of Gigha and Cara, and living on rabbits, is, of course, the crofters' tame cat run wild.

hardly desirable to make too prominent before extinction takes place.

It will be seen from the following remarks that the Wild Cat is now extinct throughout a large portion of Scotland—*viz.*, all south and east of a line commencing, roughly speaking, at Oban, in Argyleshire, passing up the Brander Pass to Dalmally, following the boundary of Perthshire, and including Rannoch Moor; continued north-westward to the junction of the three counties of Perth, Forfar and Aberdeen; thence across the sources of the Dee northward to Tomintoul, in Banffshire; and, lastly, from Tomintoul to the city of Inverness. Northward and westward of this line the animal still keeps a footing in most suitable localities, finding its principal shelter in the great deer-forests. Throughout the still-inhabited area there are many large extents of apparently suitable country where it is very scarce, and where it would soon become extinct were these tracts not at intervals replenished from the increase in the above-named sanctuaries. Thus the low-lying country in the east of Rosshire and the Black Isle of Cromarty, and certain parts of Caithness and Sutherland, have long been quite, or almost, unfrequented by them. They travel, however, long distances, as is evident from their tracks in snow and other signs constantly brought before the notice of foresters, shepherds, fox-hunters, and gamekeepers, who are well acquainted with their habits and haunts. A very considerable district may be thus tenantless for a number of years, and they may suddenly reappear at haunts long since believed to have been deserted for ever. They naturally choose the cairns most suitable for their harbourage on arrival in a new country; and thus cairns long ago known as the favourite haunts of the species, are rediscovered and reoccupied. Here also the great use of the study of topography and the names of localities is evident, if one desires to form a correct notion of the early distribution of many species.

Information derived from Mr. Alston's correspondence with Mr. A. H. Cocks and others confirms the above general remarks. The following extract from a letter by Mr. A. H. Cocks, dated March 7th, 1879, to Mr. Alston, shows the present distribution of the species from another point of view:—

"The Wild Cat," he says, "appears still to occur over the whole counties of Sutherland, Ross and Cromarty. I have not heard of it in Caithness, but although the north end of that county

is lowland, its range is pretty sure to overlap the S.W. border; also through the greater part of Invernesshire, but not, I think, in the east-central part of the county—*i. e.*, the neighbourhood of the Spey. I suppose it still exists in parts of Argyleshire, and in the S.W. corner of Aberdeenshire (Braemar district), but cannot personally answer for either county. It has disappeared long since from the Lower Speyside (Moray and Banff), and although it may cross the northern border of Perthshire, it certainly does not penetrate very far into that county."

Having thus sketched the general boundary lines of its present domains, I proceed under each county,—commencing in the South of Scotland,—to endeavour to trace the steps of its retrogression and dates of its extinction.

Berwickshire and the Border Counties.—Mr. James Hardy, of Old Cambus, has exhausted the subject as regards Berwickshire and the Border Counties, in two papers contributed by him to the 'Proceedings of the Berw. Nat. Club' (vol. iii., pp. 357-59; vol. vii., pp. 246-50 (1874); and vol. ix., p. 15). He himself saw the last on record on the 17th March, 1849, near the Swallow Craig, not far from Old Cambus, on the coast of Berwickshire, where his father, more than forty years ago, "used to see them when they were still numerous." Mr. Hardy also mentions numerous other localities in the county of Berwick frequented by Wild Cats within the memory of people still or lately living.* In the second of his communications Mr. Hardy gives still further proof of its former occurrence, and refers to recent correspondence in the 'Kelso Chronicle,' where he gives other evidence of its having been familiar to the country people. Evidence is also adduced from the names of many localities,† showing that they have formerly been associated with the native Wild Cat. Some of these are, "Wulcat Yett," near Jedburgh; "Cat-lee-burn," in Southdean; "Cat-cleugh," in Liddesdale; and others, both on the Scottish and English sides of the Border. We may remark here, while on the subject of topography, that names of localities occur, either in Scotch or Gaelic, called after

* *E. g.*, "Coves" on the coast between Old Cambus and Fast Castle; Windylaw Cove; the woods above Pease Bridge; Penmanshiel Wood; near Blackie, &c.

† Ogle Burn; at The Sling, near the head of the Monynut Burn, there was a colony above forty years ago; Keilder, &c. (*op. cit.*)

the species, in almost every county of the mainland of Scotland, indicating a wide range before they began to decline; and they were so common that they were considered as animals of the chase, and sportsmen sallied out for their destruction (Fennel, 'Field Naturalist,' 1834, p. 191). Some of these localities, however, are thus named, not after the Wild Cat proper, but after the Marten-cat, and it is now next to impossible to decide, in every case, which of the two species suggested the name. It is to be hoped that before long the results of close attention devoted to this most interesting branch of study—topography—by an able Gaelic scholar, will throw considerable light upon the former distribution of many of our indigenous animals.

Dumfriesshire, Kirkcudbright, Wigton.—Examining into the authenticity of the traditional last-killed Wild Cat, which is reported to have been obtained at Mabie by a keeper named Cameron, I find that it is not authentic. The specimen has been in the Observatory Museum, Dumfries, for somewhere about thirty-four years, and on close inspection proves to be only, as Mr. Service neatly expresses it, an unusually "fiercely-stuffed specimen" of the common tabby. There are other traditions of Wild Cats in the Stewartry, and we certainly believe that they are not all purely mythical, though it is difficult to authenticate each statement. All, however, appear to agree in this, that no true Wild Cats have been known to exist in the district for more than fifty years. On the other hand, many agree that true Wild Cats were not uncommon at one time. Mr. John M'Kie, of Anchorlee, writes to Mr. Service that they were common on the Souwick shore about the beginning of the century. It was related to Mr. M'Kie, when a boy, by a native of the parish of Borgue, named James M'Taggart, that he saw two fox-hounds belonging to "Alexander," the county huntsman, so torn by one or more Wild Cats near the cliffs at Souwick Glebe, that they had to be destroyed; and that ever afterwards Alexander avoided the place when hunting. "And," continues Mr. M'Kie, "even in my own recollection, it was with considerable doubt that we approached the place when out birdsnesting." The same person told Mr. M'Kie that the last of the breed was killed by a man named Beck, then farmer in Balmaangan; but Mr. M'Kie does not remember the exact date, "but it must have been sixty or seventy years ago," say 1810 or 1820. These traditionary records are worth preserving,

though necessarily incomplete. Beyond these records, the memory of the Wild Cat in the Stewartry only lives in the names of places,—of which, however, a good many bear evidence of its former presence, such as "Wild Cat Craigs," "Wild Cat Wood," &c.,—having regard, however, to what has already been said of these names. Dr. Grierson, of Thornhill, writes me there are certain traditions in his neighbourhood of its former occurrence, but he is of opinion that none of these can be relied upon.

Other Counties in South of Scotland.—All the evidence shows that it is long since the Wild Cat became extinct in the counties south of the Firths of Forth and Clyde—so long, indeed, that it seems impossible to collect anything but negative evidence, or the evidence which may be considered as existing in names of places called after the species. Thus it will be seen that it has retreated from the greater part of South Scotland, and has lingered longest in the most mountainous districts. Parallel facts with regard to the gradual disappearance of the Marten in the South of Scotland will show that these appear to be the directions of the retreat of more species of indigenous *Carnivoræ* than one, and a study of the decrease and extinction of the Squirrel in the South of Scotland points to similar, or somewhat similar, results. While the central counties of S. Scotland have been longest deserted, the Cheviots, and the counties north of the Firths of Forth and Clyde have afforded longer harbourage to these and probably to other species. They have retreated southwards, on the one hand, to the range of Cheviots, and northwards, on the other, to the wilder country beyond the Firths of Forth and Clyde.

Dumbarton.—Passing now to the counties north of the Firth of Clyde, Mr. John Colquhoun informs me that the last-killed in Dumbarton was in 1857, by Archibald M'Donald, gamekeeper to the late Sir James Colquhoun, Bart., of Luss. It was killed on Rossdhu Property, and not one has been seen since. Another, trapped also at Rossdhu, is in the collection at Rossdhu House. Mr. J. Colquhoun tells me they were plentiful in the county in the beginning of the present century, and he has perfect recollection of hunting them regularly when a boy.

Stirlingshire.—A Wild Cat is recorded by Macgillivray as having been killed in the county; this was, of course, prior to 1830, the date at which he wrote ('Nat. Library,' Brit. Mam., p. 193). The 'New Statistical Account' (Stirlingshire, p. 75) records them

as extinct in 1842 in Fintry and Campsie parishes, but as still existing in Strathblane, but such a statement is open to considerable doubt. Two Wild Cats were presented to the Hunterian Museum in Glasgow by the late Duke of Montrose, which were killed on his property, and these are still in the said collection. Mr. John Young informs me that there are no documents nor information in the Museum throwing any light upon the date when they were sent there. "I should say," continues Mr. Young, "that they must have been sent some forty or fifty years ago. I have been here some twenty-one years, and when I came to the Museum they looked nearly as old skins as they do now." "Cat Craig" and "Catscleugh," near Denny, may, amongst other names of places, indicate its former presence.

Clackmannan and South Perth (isolated), Fife and Kinross.—Information from Kinross is entirely negative, and no records have been kept of the last killed, so far as I have been able to ascertain.

Perthshire.—The Wild Cat, formerly abundant throughout this county, has now become extremely rare, if not altogether extinct, except in the most remote and mountainous districts. Throughout the whole of the county south of a line drawn from the Firth of Tay through Perth, and thence to Loch Earn and Tyndrum, it must be considered extinct. One was killed at Dupplin Castle about 1852 by Mr. William Pitcaithley, jun., at Irvine Cottage. The last killed in the district south of Glen Dochart was by Malcolm Macpherson, upon Ben More, near Suie, in 1863 or 1864. It has been extinct for quite thirty years in the Valley of the Allan, and between Perth and Stirling. One was killed about that time (say 1850) on the East Hill at Gleneagles, by Mr. Anderson, gamekeeper; it was worried by his dogs. The last obtained in the Callander district was trapped in, or about, 1857, in the Glen of Leny, and is now preserved in the hall of Leny House. Another was seen by Mr. J. B. Hamilton, of Leny, about 1827 or 1828, which was killed in the same place. The keeper on Balquhidder "killed Wild Cats, amongst other vermin, about twenty-five years ago (say 1855), but they are extinct now." None have occurred for many years on the Braes of Doune, and it appears to be unknown in the Methven, Crieff, and Lyndoch distrtict. For more than forty years none have been seen around Blairgany, in the Callander district. At Cromlix, Braes of Doune, the last

obtained was trapped by Mr. J. MacNaughten upwards of twenty years ago (say 1858 or 1857); it was taken in Cambushinnie Wood, adjoining Cromlix, and was killed by a blow of a rabbit-spade. Two were killed in the west of the county, near Aberfoil, one by a keeper named Scott, the other by a shepherd and his dogs, about the year 1855.* Going a little farther north, and taking in another belt of Perthshire south of a line drawn east and west through Loch Rannoch and Killiecrankie, including the Moor of Rannoch, up to the confines of the county and the march of Argyleshire, and the head of Glencoe, we make out the species to be extinct in Breadalbane, Athole, and the district indicated, unless, indeed, the record that in 1879 one (a young female) was killed within four miles of Dunkeld, and that the tracks of another larger (and doubtless older) specimen were seen in the snow about the same time, can be held to affirm its non-extinction. Previous to this capture, which was accomplished by two shepherd-dogs, no specimen of the true Wild Cat had been secured for fourteen years (say 1865) in this district. Close to the boundary of our last belt of Perthshire—*viz.*, on the north of the line drawn through Loch Earn (*ut. sup.*)—the last killed thereabouts was at Dunira, about twenty-six years ago (say 1854), as I am informed by Mr. Duncan MacGregor, now twenty-two years gamekeeper in Glenartney. "This was at a place called Scarnach Vhor, or Big Carn. It is right behind the present Mansion House, on the face of the hill overlooking the Policies, and the capture took place under the following circumstances:—The keepers, in their rambles, noticed that foxes were frequenting the carns, and set traps in all the available places among the stones. Next morning, to their great surprise, a large-sized Wild Cat was caught. No one knew whence he had come, because not so much as a track had been seen on the snow for years previously, and none had been seen since." One was killed in 1869 in Finlarig Woods by Duncan Dewar, now gamekeeper at Remony; it was a very large female, and is now in his collection. Another was killed, also by Mr. Dewar, above Auchumore House, in 1856, in a deep glen; it was a very large

* In a recently published popular work of great merit, as regards the beautiful illustrations—*viz.*, 'Picturesque Europe'—occurs the statement that "On Ben Venue is the Coir nan Uriskin, or Cave of the Goblin's Cairn, which shelters Wild Cats and Badgers." As regards Wild Cats, however, the verb must now be used in the past tense.

male, which was sent to the late Marquis. It was a noble animal, and, as Mr. Dewar relates, easily knocked over his terrier with each stroke of its paw, and turned twice upon himself when he went to save his terrier. In 1836 three were killed by Peter Mackay, gamekeeper, who is still alive, on the hill above Taymouth Castle. It is believed to have been extinct in Glen Lyon for more than forty years. In Rannoch, also, it is probably extinct. The last killed at Dunalastair, on the river Tummel, was about the year 1852. A little farther south, on Glen Queich Moor, one was trapped in Glen Lochan, above Loch Vullein, in the Amulree district, about thirty years ago, by a keeper employed by Guthrie, the well-known head-gamekeeper at Taymouth. This would be about 1850, and none have been seen or heard of since in that district. They are extinct, also, in Glen Shee, in the east of Perthshire, the last having been trapped at Dalnaglar, about eleven or twelve years ago (say 1869 or 1870). Another is recorded as having been killed in Glen Queich, about forty years ago (say 1840) by a farmer and his dogs. The tussle was a hard one, and only under favourable circumstances could such a capture have been made. Wild Cats existed about 1842, and till a later date, on Loch Erroch side, and Mr. D. MacGregor, now deceased, could remember the young calling in the Black Wood of Rannoch when they were being fed. The general information supplied by one of my correspondents—*viz.*, that since he "took an interest in Natural History (now somewhat over twenty years) he cannot remember ever seeing or having heard of one being captured in the county of Perth"—pretty accurately fixes the date at which they became really rare there, and it will be seen that I have only succeeded in obtaining record of three instances since that time. My correspondent further adds that during that time, "the so-called 'Wild Cats' which were shot or trapped proved on close examination to be domestic cats which had taken to the woods." In these three instances, however, there is good reason to believe the genuineness of the records.

Argyleshire.—Though not extinct in this county, it has receded to the more remote and mountainous districts. It is still found not uncommonly in several districts, occasionally in Sunart, Ardgower and Morven, and Lochiel, and perhaps Ardnamurchan; also in the northern parts which are separated from Invernesshire by Loch Leven, in the upper parts by Glencreran and Glen Duror.

The last Wild Cat seen in the district around Loch Awe was near Kilchurn Castle, where one was trapped by Donald M'Kercher, gamekeeper to the Earl of Breadalbane, in Letter Wood, about 1864; it is said to have measured three feet eleven inches from the nose to the tip of the tail! I heard of one trapped also at Inverary Castle, about 1828, by Mr. George Brand, when keeper there, who tracked it for several miles in snow. In Ardnamurchan it is difficult to say if it is really extinct, as wanderers from Sunart and adjoining districts may still occasionally turn up. Be that as it may, three Wild Cats were seen in 1871, crossing from Sunart into Ardnamurchan. Two of these were trapped afterwards by Mr. Simon Ross, gamekeeper, in April, 1872, near Glenborrodale, and the third was killed further west by John Cameron, the other keeper, in June of the same year. None have been seen or heard of since. The proprietor informs me they have never been numerous since he first knew the place, in 1856, and probably not more than eight or nine have been killed on it altogether since that time. In Lochiel it has long been the practice to keep down the vermin, a clause being inserted in all Lochiel's leases binding his tenants to pay the fox-hunter for killing vermin, amongst which Wild Cats are named; and many leases of Highland estates bear similar testimony to their presence, or the necessity of preventing them becoming too numerous. In Sunart, in 1879, Mr. Murray, gamekeeper, killed a very fine Wild Cat close to Strontian House, on February 14th. Mr. Murray tells me it took away a hen from his house. Snow being on the ground at the time, he tracked it easily to a laurel-bush within four hundred yards of Strontian House. He got the hen, and, setting his traps, secured the animal by ten o'clock the same night. In 1878 Mr. Murray captured another, also in February, in Carnbaan Wood, which had committed great havoc amongst the poultry and ducks of the crofters. He got another in 1874, in October, in Arieundle Wood; and a very fine one was caught by a shepherd at Ranachan, in Camusain Wood, on the north side of Loch Sunart, which was sent alive to [illegible]ow.

Forfar and Kincardine.—As regards Forfar, somewhat vague information exists that one was killed in the north-east of the county some nine or ten years ago, and was sent to the Montrose Museum. In Glendye, which drains into the Feugh and thence to the Dee at Banchory, two were killed by a gamekeeper named

Clark in 1850—the only ones seen in that quarter for thirty years previously. Glendye lies amongst the eastern extremities of the range of mountains which separates Forfarshire and Aberdeenshire.

Aberdeenshire.—The latest date I can obtain for this county is 1875, when one, a male, was killed in Glen Tanar on the 17th June by Mr. Milne, and none had been obtained there for thirty-six years previously. The next date is 1862, when one was trapped in the Invercauld district of Deeside, on February 11th, by James Lundie. "It was trapped at a rabbit-burrow close to where the road crosses Aultdowrie Burn between Aultdowrie Cottage and Invercauld House. It was afterwards stuffed and sent to Invercauld House." I have much corroborative evidence that this was the last killed in the district, but the appearance of others has been noticed since. In the upper valley of the Dee, around Old Mar Lodge, the last killed was about thirty years ago (say 1850) by Mr. M'Donald, late head keeper. Two young ones were obtained at the same time, and were kept for some time by the Duke of Leeds. What became of them subsequently is not known. In the parallel valley of the Don, John Robb killed another, the last obtained, above Alford Bridge, about 1862; and one only has been seen since, which latter may possibly have wandered to Glen Tanar and been killed as above noticed. Being a male, and possibly the last of its race for many miles round, this would sufficiently account for its wandering so far. The information that true Wild Cats are still found now and then about Mormond, near Strichen, and that four were seen at once on the farm of Techmuiry, near Mormond, about two years and a half ago (1877), requires further substantiation, as our knowledge of its present distribution throughout Scotland makes an isolated occurrence here extremely doubtful, as will be seen if the lines indicating the borders of its present territory be compared on the map of Scotland with the situation of the locality named. At the same time the description given of the animals seen somewhat answers that of the true wild species; in the absence, however, of more conclusive proof, it will be advisable to leave this an open question. Any future authentic occurrence here, however, may safely be held to substantiate this record.

Banff, Elgin, and Nairn.—Capt. Dumbar-Brander, of Pitgaveny, who has lived in Morayshire for the last fifty years, has

no recollection of seeing one, or hearing of one, killed in the low country—*i. e.*, from the Spey to the Findhorn along the coast, a distance of eighteen or twenty miles, and extending inland eight or ten miles to where the hills and the grouse-grounds begin. High up between the sources of the Findhorn and the Spey (Invernesshire) one is occasionally obtained. The only one of which the Rev. George Gordon, of Birnie, has any note in Moray, was killed at Cawdor, in Nairn, nearly fifty years ago. Edwards mentions one he saw which was killed in Glen Avon, but he gives no date: he considers it extinct now, though once abundant in the higher country. Besides the above information, I am informed of one which was killed at Dalry about nineteen years ago (say 1861). It used to be not uncommon long ago in Darnaway and Dalry Forests, near Forres, where, however, it is believed to be now extinct.

Invernesshire.—From this county I have a large store of information, which, however, I do not consider it desirable to impart in all the minutiæ at present. It will be time enough for this when its extinction has actually taken place. It is becoming scarce all along Spey, even at Badenoch, and as far up the valley as Laggan, where the last—"a very old one"—was killed in 1873. It is not yet, however, extinct there. This one was killed at the back of the Manse at Laggan, on the glebe-lands, where there are large cairns frequented by rabbits.* In the Badenoch Forest and on the confines of North Perthshire, Aberdeenshire, and Banffshire, and in Rothiemurchus it is verging on extinction, if not already extinct. In Abernethy Forest it is extinct, and the last killed in Glenmore was in 1873. It is common still in Lochaber, Nether Lochaber, Arisaig and Moidart, Knoidart, and in all the suitable valleys of Northern Invernesshire north of the Caledonian Canal, where it is believed actually to be increasing in numbers in certain localities, owing to the protection afforded to it in the numerous deer-forests. The Rev. Alexander Stewart has recorded one seen, amongst others, by himself in the face of a cliff in a place called "Dubh-ghlaic," or Black Gully, in Lochaber, three years ago (1877), and of another killed under peculiar circumstances, also in Lochaber, about 1868 (see Zool.

* This one was preserved and stuffed for the Rev. Mr. M'Fadyen, of Laggan, lately deceased.

1880, p. 218). In Glen Nevis it is verging on extinction, and very few have been killed within the last ten or twelve years. One was killed in 1878 in Ben Alder Forest, three miles from Loch Erroch Lodge.

Rosshire and East Cromarty.—In Rosshire the Wild Cat is still abundant in the wilder portions, especially in the west of the county. I possess much interesting matter, kindly placed at my disposal by correspondents; but, for the reasons given under Invernesshire, I think it undesirable to communicate them. One correspondent, who has seen many specimens of the true Wild Cat, writes, "The largest I ever saw was forty-three inches long from nose to tip of tail." In East Rosshire, however, it is probably approaching extinction. The last killed of which I have record was by Mr. A. MacDonald about seven years ago (say 1873). It was thought rare at that time. "One blow behind the ear settled him." In Strathconan they still exist, but are very scarce, whereas ten or fifteen years ago they were very plentiful. Mr. F. D. Godman, in a letter to me, incidentally mentions a Wild-Cat-inhabited cairn on a shooting at Killellan, on Loch Alsh, Rosshire, and he found there a litter of Wild Cats which had been washed out and drowned by heavy rains and a thunderstorm. He does not, however, mention the date beyond "some years ago."

Sutherland.—Wild Cats are still far from being exterminated, and are still not uncommon in deer forests. The Duke desires to preserve them, and few are willingly killed, at least in his own Forest of Dunrobin. During hard winter-weather five years ago (about 1875) a very large one was caught within the precincts of the town of Golspie. Between the place where it was caught and the moorland, there were two miles of cultivated land, high road, woodyard, and garden. It had dug a hole under the floor of a lumber shed, and had there stored up six hens. The Rev. James M. Joass, who informed me of its capture, which took place not far from his house in Golspie, adds:—"It was brought to me fresh out of the trap and bleeding. It is now in the museum at Dunrobin, and the largest specimen there—a full-grown male, with perfect teeth and tail of the undoubtedly wild type." Another was killed, whilst swimming in Loch Brora, by a woman. Rev. Dr. Joass writes as follows:—"A woman walking towards Brora, on the Carril side of the loch, saw the cat in the water coming as if from the Gordonbush side, where there is a farm-

house, across a narrow part of the loch, where it is very deep, to the Carril Rock, where Wild Cats breed, and are occasionally trapped. Fearing lest, if she allowed it to land, she should have to turn back for a mile or more, and go round by the bridge, she resolved to attack it in the water, and partially stunned it with a stone. By the time it crawled ashore she had found a suitable stick, and killed it at the water's edge. The cat was afterwards seen by several who were well able to tell a Wild Cat from a tame one." I will here repeat the oft-quoted "List of Vermin destroyed and premiums paid for the same on the Duchess-Countess of Sutherland's Estates in the County of Sutherland, from March, 1831, to March, 1834."* From this list it appears that during that time 901 Wild Cats,† Martens, and Fumarts were destroyed; 2s. 6d. was given for each head, representing for these animals alone £112 12s. 6d. According to a list of vermin killed on Dunrobin Grounds, house cats and Wild Cats are distinguished, and six is the number of the latter killed, or reported, between 1873 and 1880. I am indebted to Mr. Inglis for this list of vermin, which presents much of interest to those who study the past and present distribution of our indigenous animals. From similar returns kindly placed at my disposal by Mr. M'Iver, from the Assynt and part of Durness districts, I find that one keeper in Assynt killed no less than twenty-six Wild Cats between 1869 and 1880, but of these only three during the last six years. Another keeper killed ten between 1870 and 1873, but none again until the winter of 1879-80, when he killed four, one of which is described as a "monster." This last was sent to Mr. M'Leay, Inverness, and eventually it was sold to a gentleman in Edinburgh.‡ In Durness they appear to be scarcer, judging from the returns. Between 1870 and 1880 records of two only, and these in 1878 and 1879,

* "On the Quadrupeds and Birds inhabiting the County of Sutherland, observed there during an Excursion in the Summer of 1834," by P. J. Selby, F.R.S.E., F.L.S., &c. (Edin. New Phil. Journ., Jan.—April, 1836, p. 158).

† In such lists, however, it is not always easy to separate veritable Wild Cats from tame, and the statistics must be taken "*cum grano salis.*"

‡ The keeper referred to reports, "About four or five years ago I used to get a great many more, but the vermin are getting very scarce now." I may add here that a large number of lists of vermin received by me from Sutherland and various other parts of Scotland show the general decadence of the species in a very distinct and undeniable light.

being noted. In 1879 Mr. P. D. Maloch, of Perth, received "two or three" Wild Cats from Sutherland. Mr. T. E. Buckley informs me that in 1878 he got three cats, "which we took to be crosses between a Wild and a house cat, but the old ones were never caught, though one left its foot in a trap."

Caithness.—From Caithness I have no positive information, and I should be glad to have a correspondent in that county. From what has been said, however, by Mr. A. H. Cocks, in the introductory portion of this account, it would seem probable that the Wild Cat is restricted in its range to the parts of the county bordering upon Sutherlandshire.

In conclusion, I may observe that the above notes cannot be held to exhaust the subject—far from it. Every day up to publication brings in fresh data and new facts, tending to render the account of the species still more complete. Such notes I carefully preserve for further use, and I need not say any additions that your readers can make to the records will be very acceptable.

OCCASIONAL NOTES.

The Beaver in Norway.—We learn from 'Nature' (Nov. 25th) that much interest has been excited in Norway by the recent appearance of a colony of Beavers on the Voldifjord, a branch of the Frierfjord, which is at a considerable distance from the Beaver-station still remaining at Omli on Nedenæs.

White-beaked Dolphin in the Firth of Forth.—At the last meeting of the Glasgow Natural History Society, held November 30th, a paper was read by Mr. John M. Campbell on the occurrence of the White-beaked Dolphin, *Delphinus albirostris*, near the Bell Rock, in the Firth of Forth, in September last. The writer stated that although many of the rarer Cetaceans frequent our coasts, yet the imperfect knowledge we have of their habits, the difficulty of capture, and the nature of the element in which they live, all militate against the rapid accumulation of facts relative to their occurrence. The species in question, although recorded as British in 1846, has not yet been added to the Scottish fauna. Mr. E. R. Alston, in his list of the 'Mammalia of Scotland,' published by the Society last year, says:—"The White-beaked Dolphin is another species whose appearance in Scottish waters is to be expected, as it seems to visit the Færoes, and the east coast of England, but as yet its actual occurrence does not seem to have

been recorded." Mr. Campbell then noticed the instances on record where this species has been captured in English waters, and at various places on the Continent of Europe, and gave descriptions of the specimens and details regarding them. The specimen now reported as the first captured in Scottish seas is a young male. It was taken by some fishermen near the Bell Rock on the 7th September last, and came into the hands of Mr. Thomas Walker, fish merchant in the city, and was by him presented to the Kelvingrove Museum.

[Mr. Campbell has been good enough to send us a full description, with measurements, which we hope to publish in our next number.—Ed.]

Ornithological Notes from North Northamptonshire.—A Hobby (*Falco subbuteo*) was killed by the gamekeeper of my neighbour, Mr. G. E. Hunt, early in July, and sent to me in the flesh; but in my absence the specimen was allowed to putrefy before it was sent to be preserved, and consequently lost to me. The person who killed this little Falcon positively assures me that he shot it in the act of attacking some young Pheasants at the coop; the species is not very uncommon with us, but as this is the first well-authenticated instance of its attacking young game which has come to my knowledge, I consider it worthy of record. The swampy condition of our meadows in the valley of the river Nen, after the floods of July and the early part of August, brought us a large number of Snipes (*Scolopax gallinago*), a bunch of some forty Teal (*Anas crecca*), a few Curlews and Redshanks (*Numenius arquatus* and *Totanus calidris*), an unusual number of Green Sandpipers (*Totanus ochropus*), some Spotted Crakes (*Crex porzana*), and a Falcon (*Falco peregrinus*), during the latter-named month. With the exception of the Redshank and Spotted Crake, none of the above-named species are uncommon in our neighbourhood; but we seldom see Snipes in any number before September, and still less often more than a few odd Teal before the end of that month; the Falcon no doubt was attracted by the Teal, and the very large flocks of Peewits (*Vanellus cristatus*) which were then haunting the meadows; we generally expect a Falcon or two with our first flights of winter fowl, but I have noticed for many years that, as soon as Teal appear in any number, a Peregrine is not far off. I have already recorded in 'The Zoologist' the occurrence of a Great Snipe (*Scolopax major*) on 13th September. I noticed the first Redwing (*Turdus iliacus*) of the season on September 17th. A small flock of some seven or eight Dunlins (*Tringa alpina*) visited our meadows September 18th. First Jack Snipe (*Scolopax gallinula*) of the season shot September 21st. First Ring Ouzel (*Turdus torquatus*) of season seen September 30th. On October 8th Mr. G. E. Hunt shot a Common Scoter (*Oidemia nigra*), female, and a Scaup (*Fuligula marila*) on

the flooded meadows not far from Aldwinkle. The former species is of course only a rare straggler so far inland; the Scaup has often occurred in our neighbourhood, but never before, to my knowledge, except in the depth of winter. Five immature Golden-eyes (*Clangula glaucion*) were shot on the Nen, near Aldwinkle, about October 18th. First Fieldfare (*Turdus pilaris*) of the season shot October 22nd. First Woodcock (*Scolopax rusticola*) of the season shot October 23rd. On November 12th I received a Merlin (*Falco æsalon*), female, juv., from one of my gamekeepers, who shot it in one of our meadows on the Nen, as it flew over his head with a Yellow-hammer in its talons. I have no exact record as to the first appearance in our neighbourhood this autumn of the Grey Crow (*Corvus cornix*), but I found them in force in West Norfolk on October 12th, and in Northampton-shire on my return thither on the 20th of that month. Several Short-eared Owls (*Asio brachyotus*) were met with in our neighbourhood towards the end of October, and one of this species sent to me in the flesh from Lilford November 15th. The summer floods must have destroyed many nests of Reed and Sedge Warblers (*Salicaria arundinacea* and *S. phragmitis*), both of which species are usually very abundant on the banks of the Nen, but were this year exceedingly scarce. We found an unusual number of Landrails (*Crex pratensis*) in the clover and turnips when Partridge-shooting in September; this was no doubt caused by the quantity of water in the meadows.—Lilford.

Ivory Gull, Hoopoe, &c., at Redcar.—I omitted to mention before that an Ivory Gull was shot on the sands near East-scar, at Redcar, in November last year, and is now in the possession of a friend of mine. The taxidermist who preserved it has been in the neighbourhood for upwards of thirty years, and never before had one through his hands; it is in the plumage of the second year, a few dark spots on the head and neck, the back, wings and breast white. About the middle of September a Hoopoe was shot near Marske, and is preserved by a birdstuffer at that place. The abundance of Wheatears and Redstarts, mentioned by Mr. Cordeaux (p. 486), extended to the north of Yorkshire. Early in September I noticed some dozens of these birds amongst the bents on the side of the Tees breakwater; Wheatears are common enough with us in autumn, but I was much surprised on seeing such a quantity of Redstarts in a place where I do not remember ever to have seen one before. Although the autumnal migration commenced very early on this part of the coast,—large flocks of Whimbrels being seen on July 4th during a northerly gale, and others continuing to arrive almost daily,—yet the Tees-mouth was by no means "up to form" in the matter of shore-shooting, and I have very little to chronicle from that quarter, the only circumstance worthy of note, besides those already mentioned, being the appearance of a flock of Dotterels during the first week in September, but none of them were captured. The Dotterel has

become exceedingly rare in this district, the above-mentioned flock, composed of some dozen birds, being the first I have heard of for some years.—T. H. Nelson (North Bondgate, Bishop Auckland).

Autumn Migration of Birds on the East Coast.—On October 10th I saw two Ring Ouzels, presumed to have just arrived; these birds are very scarce in this neighbourhood. On the 11th, thousands of Rooks, Crows, Thrushes, and Larks were seen at daybreak coming over the sea; they continued to arrive all day, and at night Thrushes might still be heard migrating. Saw the first Hooded Crow to-day. A Mountain Finch was shot on the Dovercourt beach. A fine Norfolk Plover, sent me on the 11th, was shot the previous day at Bradfield, near Harwich, in a turnip-field. On the 20th several Woodcocks were seen migrating; one flew into the yard of 'The Cups Hotel' at Harwich; another flew against a window and was caught by a dog. On the 29th several Storm Petrels were seen in the harbour; one was picked up dead, probably exhausted by the fury of the storm. On November 4th the first flock of Snow Buntings were seen on the Dovercourt beach, and two in good plumage were shot. A Purple Sandpiper was also shot.—F. Kerry (Harwich).

Glossy Ibis in Aberdeenshire.—A Glossy Ibis, *Ibis falcinellus*, was shot on the mud-flats near the mouth of the river Ythan, in this county, on October 4th. The bird was a male, and in fine condition; its stomach was filled with a fibrous vegetable matter, along with sixty-six specimens of the rat-tailed maggot (larva of the dron fly, *Eristalis tenax*); two small pupæ, different, and unknown to me; four species of beetles, two of one sort and one each of the others, one of them being aquatic; four specimens of *Cyclas flavescens;* fragments of *Limnæus pereger;* and eight small specimens of *Mytilus pusillus*, as also five angular pieces of stone about the size of small peas. Extent of wings, 39½ inches; from point of beak to end of tail, 24 inches; tarsus, 4¼ inches; middle toe, including nail, 3¼ inches; beak, along ridge, 5½ inches; beak, eyes and toes, greenish grey; sides of head bare, and of the same colour as the beak; these bare parts, at their juncture with the feathers, both above and below the eyes, were edged with a narrow line of greenish white; iris brown; weight, 1½ pounds. The sixth known to have occurred in Scotland.—G. Sim (King Street, Aberdeen).

Roseate Tern on the Norfolk Coast.—A beautiful specimen of the Roseate Tern, *Sterna Dougallii*, Montagu, was shot near Hunstanton, Norfolk, on July 12th, and the skin is now in my collection. The person to whom it was sent for preservation neglected to ascertain or note the sex of this specimen, but I believe it to be a male, and certainly not a bird of this year. The attention of the shooter was attracted by the call of this Tern, which differed greatly from those of the Common and Little Terns, *Sterna fluviatilis* and *S minuta*, both of which species were very abundant at the date above-mentioned, in the same locality.—Lilford.

Storm Petrels in Yorkshire.—Two of these birds were captured inland during October. On the 29th one flew into a person's face in our station-yard, and was knocked down as a Swallow, and taken to Mr. Helstrip, birdstuffer, where it died during the night. The other was taken alive at Sowerby, near Thirsk, and preserved by Mr. Robert Lee, naturalist, in that town.—James Backhouse, jun. (West Bank, York).

Little Gull on the Mersey.—On November 1st, I received a specimen of the Little Gull, *Larus minutus*, which had been shot on the Mersey, off New Brighton. I believe it is the first time that this bird has been seen in the locality.—W. Bell (St. George's Mount, New Brighton).

[In Byerley's 'Fauna of Liverpool,' the Little Gull is stated to have been met with near New Ferry, and at Formby.—Ed.]

Great Grey Shrike in Yorkshire.—I saw a Great Grey Shrike close to this village on the 23rd of October. This bird has occurred in the West Riding several times before.—John H. Salter (Ackworth, near Pontefract).

[The Great Grey Shrike seems to have been more than usually common during the present winter. The immigration of this winter visitant seems to have commenced during the last week of October, when specimens were shot in Northumberland, at Whitley Sands, and at Misterton, Nottinghamshire; and during the month of November we noticed its occurrence at Laxton (also in Notts); at Brancaster; Holt (Norfolk); Seaton Carew; Tenbury (Worcester); Mere (Wilts); Ringwood (Hants); and Cranleigh (Surrey).—Ed.]

Hoopoe in Shetland.—On 18th October last, a specimen of the Hoopoe, *Upupa epops*, was shot in Unst, and sent to me. It was a female, and its stomach was filled with earwigs, *Forficula auricularis*.—George Sim (King Street, Aberdeen).

Correction of Error.—By some mistake in the title of Dr. Hamilton's article in the last number of 'The Zoologist,' "Sutherland" was printed for "Scotland." The title should have been "Ornithological Notes from W. Scotland."

The Mackarel Season in Cornwall.—During the last week of November our drift-boats were taking large, fat, and well-flavoured Mackarel by thousands per night. Generally catches of this sort do not occur after the beginning of June or before the end of February. We are accustomed to see small quantities of small Mackarel of very good quality taken with the later Pilchards even up to Christmas, but these catches of large fish at this time of the year are unusual. Whether they are late fish of the current year or early fish of the coming year it is impossible to say. A point

worthy of remark is that the Pilchard season of 1879 ran in an unprecedented manner into January, 1880, whilst the Mackarel season of 1880 commenced in an equally unprecedented manner in the latter part of January, 1880.—Thomas Cornish (Penzance).

Jersey Fishes.—My assistant, Edward Matthews, has recently returned from a collecting expedition to the Channel Islands. Amongst other fish obtained while in Jersey, he took specimens of *Labrus Donovani* and *Lepadogaster Condollii*, the former from lobster-pots and the latter from under stones in rock-pools at low tide.—John T. Carrington (Royal Aquarium, Westminster).

[We should have been glad of a little more information concerning these two uncommon fishes. Is the first named identical with the Comber Wrasse of Couch (vol. iii., p. 32), or in what respect does it differ from it? and has the latter been met with on the British coast? We do not recognise the specific name. Descriptions from living specimens are always valuable.—Ed.]

Flight of the Flying Fish.—Apropos of the remarks which appeared under this heading in 'The Zoologist' for November (p. 471), the following observations by Mr. Moseley, in his 'Notes by a Naturalist on The Challenger' (p. 570), will be read with interest by all who are interested in this question. He says:—"Whilst on the subject of flight, I would say a few words about the flight of the Flying-fish. Dr. Möbius has lately produced an elaborate paper on the much-vexed question as to whether Flying-fish move their wings in flight or not, and after examination of the muscular apparatus, and watching the living fish, has come to the conclusion that they do not do so at all. There are two widely different genera of fish, which have developed long wing-like fins for support in progress through the air, the ordinary Flying-fish, the various species of *Exocœtus* allied to the Gar-fish, and the flying Gurnets, species of the genus *Dactylopterus*. I have never seen any species of *Exocœtus* flap its wings at all during its flight. These fish merely make a bound from the water, and skim supported by their extended fins, the tips of which meanwhile quiver in the air somewhat occasionally from the shifting a little of their inclination by the fish. I believe, however, that I cannot be mistaken in my conviction that I have distinctly seen species of Flying Gurnets move their wings rapidly during their flight. I noticed the phenomenon especially in the case of a small species of *Dactylopterus* with beautifully coloured wings, which inhabits the Sargasso Sea. Whilst out in a boat collecting animals amongst the gulf-weed, these small Flying Gurnets were constantly startled by the boat and flew away before it, and as they did so, appeared to me to buzz their wings very rapidly. Their mode of flight seemed to me to be closely similar to that of many forms of grasshoppers, which cannot fly for any great

distance, but raise themselves from the ground with a spring, and eking out their momentum as much as they can by buzzing their wings, fall to the ground after a short flight. I watched these little Flying-fish fly along before the boat, at the height of about a foot above the water, for distances of fifteen or twenty yards, and I chased and caught one or two with a hand-net amongst the weed. Dr. Möbius, who similarly watched the flight of a species of Flying Gurnet, maintains that neither forms of Flying-fish flap their wings at all during flight. *I do not consider the question as yet set at rest.* Of course no Flying-fish can raise themselves in the air at all by means of their wings alone." [The italics are ours.—Ed.]

Habits of the Tarentula.—Herr V. Bergsö, in a recent work, 'Fra Mark og Skov,' has given some interesting data in regard to the habits of the Tarentula, *Lycosa tarentula*, Latr., whose nests he has traced and examined on the Roman Campagna. He found that the nest, which was well rounded and smooth, was approached by a tunnel which, after running about a foot straight down below the surface of the ground, made a sudden short turn before it finally descended for about another foot into the spider's abode. The entrance to the tunnel is concealed by an arched covering made by the interlacing of grasses and leaves. The eggs are inclosed in a spun bag, and the young appear in the autumn, when they immediately seat themselves on the body of the mother, where they remain till about April, neither parent nor offspring seeking food during their hybernation. As many as 291 individuals were on one occasion removed in February from the body of an emaciated Tarentula. The superstitious error of assuming that the bite of the animal induces an irresistible desire of dancing is due to the fact, that dancing having been originally employed as a remedy against the poison, which is believed to be eliminated by profuse perspiration, the action of the poison was confounded with the means of its eradication.—'*Nature*,' *November* 25th.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Linnean Society of London.

November 18, 1880.—Robert M'Lachlan, Esq., F.R.S., in the chair.

Lieut.-Col. H. Godwin-Austen was elected a fellow of the Society.

Dr. George E. Dobson exhibited a remarkable parasitic worm, taken by him from the intestinal canal of *Megaderma frons*, from the Gold Coast. It appears to be allied to *Pterygodermatites plagiostoma*, Wedl, from the intestine of the Long-eared Hedgehog, *Erinaceus auritus*, though on the

first examination he (Dr. Dobson) had inclined to regard it as representative of a new genus, *Metabdella* (see 'Nature,' No. 593).

Dr. J. D. M'Donald drew attention to its peculiar anatomical structure and natural relationships, still further to be elucidated by him shortly in the 'Annals and Magazine of Natural History.'

Dr. Cobbold agreed in the high importance of the observations as not only verifying previous discoveries, but adding novel structural details. He regarded the worm as identical with the *Ophiostomum* of Rudolphi and Willemoes Suhm, with *Pterygodermatites* of Wedl, and with *Rictularia* of Frœlich. He further looked upon it as an aberrant member of the *Ophiostomidæ*, whereas Wedl thought the parasite came nearest to the *Cheiracanthidæ*.

Dr. Cobbold exhibited five specimens of *Distoma crassum*, Bush. He stated that the Chinese missionary whose parasites had been brought before the Society in 1875 had, on his return to China, again become the victim of these large flukes. Not only so, but his wife and daughter were attacked, and all of them had been compelled to return to England.

A paper, "On the Classification of the *Gasteropoda*" (part ii.), was read by Dr. J. Dennis M'Donald. In this communication the author gave further data in support of his mode of classification of the group dependent on anatomical characters.—J. Murie.

Zoological Society of London.

November 30, 1880.—Dr. Edward Hamilton, Vice-President, in the chair.

Mr. Alfred E. Craven read a paper on a collection of land and fresh-water shells from the Transvaal and Orange Free State in South Africa, with descriptions of nine new species.

A second paper by Mr. Alfred E. Craven contained the descriptions of three new species of land shells from Cape Colony and Natal.

Surgeon Francis Day communicated a paper by Prof. A. A. W. Hubrecht, which gave an account of a collection of reptiles and amphibians made by Dr. C. Duke in Beloochistan.

A communication was read from Mr. J. H. Gurney, containing a description of the immature plumage of *Dryotriorchis spectabilis* (Schleg.), a very scarce raptorial bird from Gaboon, now living in the Society's Gardens.

A communication was read from Mr. Roland Trimen on an undescribed *Laniarius*, obtained by Dr. B. F. Bradshaw on the Upper Limpopo, or Crocodile River, in Southern Africa, which he proposed to name *Laniarius atrocroceus*.

A communication was read from Dr. G. Hartlaub, containing descriptions of five new birds which had been collected by Dr. Emin Bey in Central Africa. These were proposed to be called *Tricholais flavotorquata*, *Cisticola hypoxantha*, *Eminia lepida*, *Drymocichla incana*, and *Musicapa insulata*.

Mr. W. A. Forbes read a paper on the external characters and anatomy of the Red Ouakari Monkey, *Brachyurus rubicundus*, describing more particularly the liver and brain, and made remarks on the other species of that genus and their distribution.—P. L. Sclater, *Secretary*.

Entomological Society of London.

November 3, 1880.—Sir John Lubbock, Bart., M.P., F.R.S., &c., President, in the chair.

Mr. Edward Meyrick, of Ramsbury, Hungerford, Wilts, was ballotted for and elected an ordinary Member. Capt. Thomas Broun, of Auckland, New Zealand, a former Subscriber, was ballotted for and elected an ordinary Member. Dr. E. Brandt, President of the Russian Entomological Society, &c., of the Imperial Medico-Chirurgical Academy, St. Petersburg, was ballotted for and elected a Foreign Member.

Mr. C. O. Waterhouse exhibited, on behalf of Mr. Sydney Olliffe, a pair of dwarf specimens of *Epione vespertaria*, taken at Arundel.

Mr. M'Lachlan exhibited some very curious galls on a broad-leaved *Eucalyptus* from Australia. They were of large size, very hard, with four longitudinal keels, each of which was prolonged into a long cornute appendage. The maker of the galls was a Lepidopterous larva, perhaps pertaining to the *Pyralidæ*.

Mr. M'Lachlan mentioned that he had received a letter from Mr. D. G. Rutherford, from Camaroons, West Africa, in which the writer stated that he had taken *Papilio merope* and *P. cenea*, *in copulâ*, and had obtained eggs and young larvæ therefrom.

Mr. Roland Trimen observed that the observation was important as confirming the statements as to the polymorphic condition of the female of *merope*.

Prof. Westwood exhibited a globular gall on the surface of a sallow-leaf, made by a species of *Tenthredinidæ*; also a Dipterous larva (*Syrphus*), found closely adhering to the stem of a pelargonium.

Mr. W. F. Kirby exhibited, on behalf of the Rev. J. K. Brown, of Maidstone, a remarkable variety of *Epunda lutulenta*; and, on behalf of Mr. Ralfe, a specimen of *Apatura ilia*, which this gentleman stated he had captured in Pinner Wood last July.

Sir John Lubbock exhibited some interesting larvæ which Mr. Calvert had forwarded to him from the Troad, through Sir J. Hooker. He stated

that these larvæ had recently appeared there in great numbers, and were likely to prove most useful, as they fed on the eggs of locusts. The larvæ were, in his opinion, Coleopterous, probably those of a beetle allied to *Cantharis*. Mr. Riley had recently described the transformations of certain insects belonging to this group, and natives of the United States. The young larvæ on first hatching are thin, active little creatures, which eat their way into the cases of locust's eggs, where they rapidly grow into fat, fleshy grubs. Mr. Calvert states that in his neighbourhood a large proportion of the locusts' eggs have this year been destroyed by these larvæ. Sir John Lubbock suggested that if the species does not exist in Cyprus it might be worth while to introduce it there.

Mr. Roland Trimen exhibited the wingless female Hymenopteron, of which he had recently sent a sketch and brief account to the Society (see Proc. Ent. Soc., July 7th, 1880, p. xxiv), and which, from all the circumstances attending its discovery near Cape Town by Mr. C. A. Fairbridge, he had strong grounds for regarding as the female of the well-known *Dorylus helvolus*, Linn. He also showed a second specimen of the same female, presented to the South-African Museum by M. C. L. Péringuey.

Mr. Trimen also exhibited six cases fabricated by a South-African Lepidopterous larva, of which the outer covering consisted, not of pieces of grass, twigs, or other vegetable substances, but of particles of sand and fragments of stone. The very peculiar aspect of these cases was due to the fact that along each side was attached a series of much larger fragments of stone, roughly triangular in shape, and regularly arranged in a single row, with the longest point outwards; the effect of this arrangement being to give the case the general appearance of a Myriapod, and indeed a not very remote resemblance to *Peripatus*. These cases (in two instances containing the living larvæ) were found in the dry elevated "Karroo" country of the Cape Colony, in the districts of Beaufort and Clanwilliam, and were presented to the South-African Museum by Mr. Thomas Bain and Mr. J. R. Maquard respectively. Mr. Trimen was unable to rear the larva, owing to ignorance of its food-plant; but, from its appearance when out of its case, he thought that it would in all probability have furnished a large moth of the family *Psychidæ*.

Sir Sidney Saunders read a paper "On the habits and affinities of the Hymenopterous Genus *Scleroderma*, with descriptions of new species."

Mr. Edward Saunders read a paper entitled "A Synopsis of British *Heterogyna* and fossorial *Hymenoptera*."

Prof. Westwood read a paper containing descriptions of new species of exotic *Diptera*, with a supplement containing descriptions of species formerly published by the author in inaccessible periodicals.—R. Meldola, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Island Life; or, the Phenomena and Causes of Insular Faunas and Floras, including a revision and attempted solution of the problem of Geological Climates. By Alfred Russel Wallace, Author of 'The Malay Archipelago,' &c. Demy 8vo, pp. 512, with twenty-six Maps and Illustrations. London: Macmillan & Co. 1880.

There must be few, if any, of our readers who have not derived both pleasure and profit from a study of Mr. Wallace's 'Geographical Distribution of Animals,' published in 1876. The present volume, which may be considered as a popular supplement to, and completion of, that work, will afford no less gratification and instruction. It deals with highly important and interesting problems, and embodies a mass of facts collected and arranged with admirable skill and precision. Although at first sight somewhat fragmentary and disconnected, it is really the development of a clear and definite theory, and its application to the solution of a number of biological problems. That theory is, briefly, that the distribution of the various species and groups of living things over the earth's surface, and their aggregation in definite assemblages in certain areas, is the direct result and outcome of a complex set of causes which may be grouped as "biological" and "physical."

The biological causes, to use the author's own words, are mainly of two kinds—*first*, the constant tendency of all organisms to increase in numbers and to occupy a wider area, and their various powers of dispersion and migration through which, when unchecked, they are enabled to spread widely over the globe; and, *secondly*, those laws of evolution and extinction which determine the manner in which groups of organisms arise and grow, reach their maximum, and then dwindle away, often breaking up into separate portions which long survive in very remote regions.

The physical causes are also mainly of two kinds. We have, *first*, the geographical changes which at one time isolate a whole fauna and flora, at another lead to their dispersal and intermixture with adjacent faunas and floras; and, *secondly*,

climatal changes, the causes of which Mr. Wallace investigates at some length, with the aid of geologists, physicists and explorers.

In the first half of his work (pp. 1—229), Mr. Wallace deals with "The Dispersal of Organisms," its phenomena, laws, and causes. Beginning with simple and familiar facts relating to British and European quadrupeds, he defines the character of "areas of distribution" (Chap. II.) as applied to species, genera, and families, and illustrates the subject by maps showing the peculiarities of distribution of some well-known groups of birds. Taking our British mammals and land-birds, he follows them over the area they have been found to inhabit, and, classifying the facts of distribution (Chap. III.), obtains a foundation for the establishment of "zoological regions," which are clearly characterized as distinct from the usual geographical divisions of the globe.

The facts thus far established are then shown (Chap. IV.) to be necessary results of the "law of evolution." The nature and amount of "variation" is exhibited by a number of curious examples; the origin, growth, and decay of species and genera are traced, and all the interesting phenomena of isolated groups and discontinuous generic and specific areas are shown to follow as logical consequences.

Mr. Wallace next investigates (Chap. V.) the means by which animals are enabled to overcome the natural barriers which often seem to confine them to very restricted areas, the extent to which these barriers are liable to be altered or removed, and the nature of the changes of sea and land which have taken place in past times. The last-mentioned portion of the enquiry is shown to be the most important, as it is the most fundamental, and is discussed at some length, evidence being adduced to prove that the main features of our globe—the position of the great ocean and the chief land-areas—have remained, on the whole, unchanged throughout geological time. The general stability of continents, however, has been accompanied by constant changes of form, and insular conditions have prevailed over every part in succession, and the effect of such changes on the distribution of organisms is pointed out.

In the succeeding three chapters (VI., VII. and VIII.) Mr. Wallace investigates very fully the question of geological climates

and their causes, considering that changes of climate have doubtless been agents of the first importance in modifying specific forms as well as affecting the distribution of animals. Step by step the foundation is laid for a scientific interpretation of the phenomena of distribution, until the reader reaches the second part of the work (pp. 233—512), which embodies the results of an investigation of a series of typical Insular Faunas and Floras, with a view to explain the interesting phenomena they present.

Amongst other conclusions arrived at, Mr. Wallace argues, from the evidence which he adduces, that "mere distance is one of the least important of the causes which have determined the likeness or unlikeness in the animals of different countries;" "that such differences and resemblances cannot be due to existing conditions, but must depend upon laws and causes to which mere proximity of position offers no clue;" and "that if we compare corresponding portions of different continents we find no indication that the almost perfect similarity of climate and general conditions has any tendency to produce similarity in the animal world."

In conclusion, Mr. Wallace expresses his conviction of the complete interdependence of organic and inorganic nature. "Not only," he says, "does the marvellous structure of each organised being involve the whole past history of the earth, but such apparently unimportant facts as the presence of certain types of plants or animals in one island rather than in another are now shown to be dependent on the long series of past geological changes,—on those marvellous astronomical revolutions which cause a periodic variation of terrestrial climates,—on the apparently fortuitous action of storms and currents in the conveyance of germs,—and on the endlessly varied actions and reactions of organised beings on each other."

We close this volume with a sense of deep obligation to Mr. Wallace. Following his guidance, we have felt as one led by some "good fairy" to the top of a high mountain; we have looked down into the valleys beneath, and beyond across the great expanse of ocean with its many islands; we have seen passes, peaks, and glaciers while listening to the story of their origin; we have noted a marvellous variety of vegetation, and have become acquainted with many strange and curious animals,

while marking the countries which they inhabit and the limits which appear set to their geographical distribution. We have felt the changes of climate as we travelled; and having followed the explanation of all we have witnessed, so attractively and withal so logically offered by our guide, we leave him with a feeling of regret that our voyage of discovery has ended.

New Guinea: what I did and what I saw. By L. M. D'Albertis. Two vols., 8vo, with four coloured plates and numerous woodcuts. London: Sampson Low & Co. 1880.

Those who follow the course of events in the Natural History world have been for some time aware that Signor D'Albertis has been engaged in exploring New Guinea. The reports of his progress and of his collections received by the Zoological Society of London, and published also in Italian and other foreign scientific journals, have awakened the liveliest interest, more especially among ornithologists and entomologists, and have served to whet the appetite for a fuller account of his travels whenever this should appear.

In two handsome volumes, with several nicely executed coloured plates and many woodcuts, Messrs. Sampson Low, Marston and Co., have just published the long-expected work, and English readers are now put in possession of the Italian traveller's narrative of his adventures. This he gives us in the form of a journal, the first volume containing an account of his voyage to New Guinea in 1872-73, and his visit to Yule Island in 1875; the second volume embodying the results of his three explorations of the Fly River, made in 1875, 1876, and 1877.

When, on the 8th April, 1872, the author first sighted New Guinea, he found himself approaching a mountainous country, overgrown with dense forest. The hills, whose base was washed by the sea, seemed to rise up as barriers to defend the entrance of the country which he proposed to explore. Behind these hills rose other and higher mountains; but all, so far as he could perceive, were clothed with rich vegetation. From Sorong to Dorey—that is to say, during a coasting voyage of 200 miles—he not only discovered no great river, but not even one that could be considered of any importance.

Although this portion of New Guinea has hitherto attracted the greatest number of travellers, and for more than twenty years several Dutch missionaries have lived here, yet the interior is the least known,—indeed we might say it is completely unknown,—Signor D'Albertis and his companion, Dr. Beccari, being as yet the only Europeans who have ventured into the interior at all. "The northern peninsula of New Guinea," says the author, "may be regarded by geographers as a virgin country."

As regards climate, within so few degrees of the Equator, the heat is, of course, great; the rainfall frequent and heavy, and the evaporation therefore considerable. The fevers common in tropical countries are rife in New Guinea, as the author and his companion discovered to their cost; and many a time was Signor D'Albertis lying at death's door, stricken down by this malignant enemy. With a good constitution, however, strengthened by judicious doses of quinine, and favoured by more than usual good fortune in meeting with assistance at critical junctures, the traveller recovered his health again and again, and with fixed resolution continued his adventurous journey, at one time going ashore to procure food and collect birds and insects, at another following the coast to land elsewhere in search of new hunting grounds; anon taking up his quarters for weeks in one spot, and exploring some rich collecting-ground, where, as at Hatam, a village on Mount Arfak, every shot brought down a bird of a new species, and every insect picked up was new to him.

Most remarkable and beautiful were many of the birds and insects met with, several of them previously undescribed and quite unknown. Of 180 different kinds of birds collected in N.W. New Guinea in 1872, thirty proved to be new species. Amongst the most noticeable are those of which the author has given coloured plates, namely, *Lophorina superba*, *Parotia sexpennis*, *Drepanornis Albertisii*, and *Paradisea raggiana*. These are all Birds of Paradise, vieing with each other in the loveliness of their plumage and the brightness of their metallic tints. No descriptions can adequately convey an idea of their strange forms and beautiful colours, and Signor D'Albertis has therefore done well to furnish tinted figures of them.

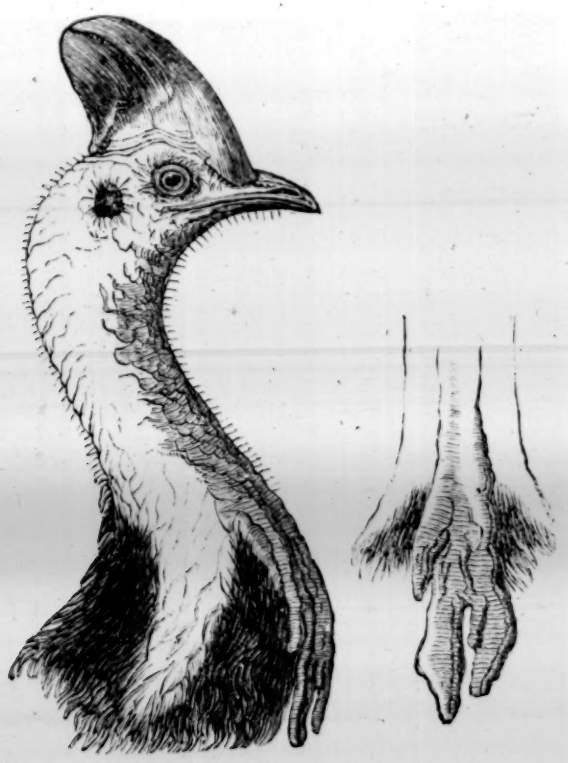
New Guinea is very deficient in Mammalia as compared with Australia, though this apparent poverty may in part depend on our very scanty knowledge. Amongst those met with by Signor

D'Albertis, we particularly notice two species of prehensile-tailed, opossum-like Phalangers (*Phalangista Bernsteinii* and *P. pennata*), and a small Kangaroo (*Dorcopsis luctuosus*), called by the natives "Barai." Full-page engravings of these are given, one of which, through the kindness of the publishers, we are enabled to

reproduce here. As an engraving it could hardly be better, the softness of the fur being capitally rendered. If, however, the artist had removed the short stump under the chin, which distracts the eye of the observer, and has too much the appearance, from its

position, of another leg, the portrait would have been still more life-like.

Our second illustration represents the head and neck-wattles of a Cassowary, which the author calls *Casuarius Becarrii*, so named after his friend and fellow-traveller, Dr. Beccari, who discovered it. It seems to us, however, that this cannot be *Casuarius Beccarii*, Sclater* (which is one of the double-wattled Cassowaries having a median throat-wattle divided at its extremity into two small lobes), but must be identical with *Casuarius tricarunculatus*, described by Dr. Beccari from Salwatti,



New Guinea.† The absence of an "Index" to the work before us is much to be regretted, for without it it is impossible to discover and compare the various passages relating to a given species which are scattered throughout eight hundred pages. It

* See Sclater, Proc. Zool. Soc., 1875, pp. 87, 527, pl. 58; and Harting, 'Ostriches,' p. 107, and Preface to second edition, p. xvi.

† Ann. Mus. Genov., vii., p. 717.

is quite possible therefore that, as regards the Cassowary just mentioned, we may have overlooked a remark of the author's which, perhaps, definitely settles its identity. And here we cannot help observing that although Signor D'Albertis has shown himself to be a most energetic traveller and enthusiastic collector, he has little claim to be regarded as a scientific naturalist. To take the Birds only, he appears to know but little of their structure and affinities, and nothing of the points which await settlement and can only be settled by those who have opportunities of examining specimens in a living or recently-killed state. This is to be regretted, for Signor D'Albertis has had rare opportunities which fall to the lot of but few—opportunities which should have enabled a trained observer to produce far more valuable results.

Nevertheless we must not forget the many new and beautiful species which Signor D'Albertis has discovered, and which but for his energy and perseverance would probably be still unknown. In this respect he has rendered a service to Science for which all naturalists will thank him. The interesting account which he has given of his travels in the two volumes before us will be read with interest not only by zoologists, botanists, and ethnologists, but by all who desire to know something about one of the most remarkable and least explored countries in the world.

Sir Andrew Smith's Miscellaneous Ornithological Papers, 1830-34. Reprinted for the Willughby Society. 1880.

We have already noticed (Zool. 1880, pp. 159, 375) the excellent aim of this Society. The present volume, the third of the series, contains a reprint of papers on Ornithology published fifty years since in 'The South African Quarterly Journal,' and hitherto practically inaccessible.

The Editor, Mr. O. Salvin, in a neat Introduction, gives a brief account of Sir A. Smith's labours as a naturalist, and of the nature and extent of his collections.